

INAUGURAL ADDRESS

DELIVERED AT

FARMERS' COLLEGE,

COMMENCEMENT DAY,

JUNE 7TH, 1854,

BY

ISAAC J. ALLEN, A. M.,

*President and Professor of Mental and Moral Science, and of the
Institutes of Civil Law.*

PUBLISHED BY THE BOARD OF TRUSTEES.

5 CINCINNATI:

PRINTED AT THE BEN FRANKLIN BOOK AND JOB OFFICE.

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CORRESPONDENCE.

Doctor Allen, President Board of Instructors Farmers' College.

SIR: The Board of Directors of Farmers' College, at their last meeting, instructed the undersigned to request of you, for publication, the manuscript of your excellent Inaugural Address, delivered on Wednesday last in the College Chapel.

I indulge a hope that it will suit your convenience to comply, at an early day, with this request.

Respectfully, yours,

JOHN W. CALDWELL,

Secretary Board Directors,

379 Main st., Cincinnati.

JUNE 12, 1854.

FARMERS' COLLEGE, COLLEGE HILL, }
June 14, 1854. }

DEAR SIR: Your favor of the 12th inst., communicating the resolution of the Trustees inviting the publication of my Inaugural Address, is before me, and herewith I place at your disposal a copy of the Address, pursuant to the flattering request contained in your note.

Respectfully, yours, &c.,

ISAAC J. ALLEN.

COL. J. W. CALDWELL, Sec'y, &c.,
Cincinnati, O.

THE HISTORY OF THE

REIGN OF

CHARLES THE FIRST
IN WHICH ARE CONTAINED
THE MOST IMPORTANT
EVENTS OF HIS REIGN
FROM 1625 TO 1649
BY
JOHN BURNET
BISHOP OF SALTHERY
IN TWO VOLUMES
THE FIRST

INAUGURAL ADDRESS.

It is a maxim from the political wisdom of Edmund Burke, that "Education is the cheap defense of Nations." Lending confirmation to this, James Madison said, "A well instructed people alone can be a permanently free people:" and John Adams declared, that "A republican government without knowledge and virtue, is a body without a soul." These sentiments, proclaimed as important doctrines—which, when proclaimed, the world was not altogether willing to sanction and adopt—have now become popular aphorisms, to be neither gainsayed nor denied. Accordingly, in matters of education, it may be noted that the great effort, and the peculiar achievement, of the age, are, not so much to magnify the endowments and to make honorable the attainments of the aristocratic few, not for the production of some "Admirable Crichton"—some "*faultless monster* that the world ne'er saw"—shining with the startling corruscations of an intellectual meteor—as to diffuse education among the common millions of mankind, as freely as falls the golden sunshine upon the broad bosom of earth. In this particular the age is marvelously peculiar. But, this marvelous peculiarity, which so strikingly marks its features in contradistinction to those of every other in all the foregone history of Time, is by no means attributable to the sudden upheaval of any especial concurring causes ori-

ginating in the present age itself: But, such characteristics are the gratifying results flowing from causes lying far back in the history of human civilization, and which seem to be now reaching their points of culmination. In the primitive periods, men sought to secure strength to the masses by the simple aggregation of numbers. Then, of course, only the chieftain, or the monarch, could be conspicuous to the world. Humanity, then swayed by the commands of one, or by the will of a few, was necessarily unsettled in purpose, and unfixed in location: that may be properly designated as the *boy-era* of history. But, humanity has since become more definitely localized; hence, more highly civilized; and man is, consequently, becoming more distinctly *individualized*. Each tribe, and every nation, has, in its aggregate features, developed its characteristic type; and now, Man, the Individual, is exhibiting powers and developing energies, which, hitherto, have been considered as belonging alone to aggregate numbers. History is no longer—what history has ever been—the mere chronicler of the levy and march of armies, the guide book to the predatory movements of devastating hordes: It has received into its composition a new element of momentous import—that element is PUBLIC OPINION! And this, instead of the aggregate of numbers—with their crushing physical force to order and direct—is the aggregate of individual thought and will, with their irresistible *moral power* to guide and to govern.

And the supervening of this new historic element is what gives rise to the imperative necessity, as well as to the public demand, for general education. When the great powers of humanity had their manifestation

through the instrumentality of aggregate numbers, the necessity of inexorable discipline was most obvious, in order to avoid the worst forms of tyranny—ANARCHY: And, what discipline was to them, education must be to us. For, despotic as were their systems, and powerful as were their aggregate numbers, still this aggregation of individual thought and will, which we denominate “Public Opinion,” is the most absolute of all earthly powers! And, thus absolute would we have it ever—But, *ever absolutely right!* To accomplish this, the enlightenment of the public mind, as the means for the formation of correct public opinion, is, obviously, a prime necessity; for, without this enlightenment by means of public education, public opinion becomes, of all despotisms, the most intolerant and oppressive. It becomes, indeed, a very Titan—but, a Titan armed for evil; while blind to good; and, like the goaded and sightless Giant of Israel, it will not hesitate, thus groping in phrenzied darkness, to grasp the pillars in the temple of human freedom, rend them from their base, and bury itself and all the cherished hopes of earth beneath the ghastly ruins. In the present peculiar phase of humanity, then, education is, emphatically, the cheap and the chief defense of nations. Conscious of this, the public mind turns to the various institutions of learning—the school and the college—which public liberality and private munificence have established, and ask for opportunities and facilities for education commensurate with the great and growing demand. Responsive to this, numerous institutions of distinguished merit have been founded amongst us, and are sustained with a flattering measure of patronage, and encouraged by a high degree of public approval.

Among those Institutions, FARMERS' COLLEGE holds a prominent position. Aiming at no distinction which it does not merit, its purpose is to merit a distinction second to none on this wide continent. Its career exhibits none of the characteristics of the ephemeron; but, on the contrary, it has progressed with a steady, healthy and permanent growth. In its origin it received no spasmodic impulse from feverish sectarianism; in its progress it has suffered no gaseous inflation from interested favoritism; in its support and government it has never been tortured into a precocious debility by the pedantic interference of speculative dreamers, nor its utility diminished by an unquestioning subserviency to the egotistical dicta of antiquity. All has been tested by the experience of years, and made to approximate continually to the useful, the substantial, the practical in modern education. Its germ was in the Academic Institute here established as early as in 1833, under the auspices of my immediate predecessor, President CARY. Through the same instrumentality "Cary's Academy," in 1846, had grown into "Farmers' College," which is now fast budding into a UNIVERSITY. With an ample legislative charter; free from debt; its financial condition sound and prosperous; its property in buildings, fixtures, investments and endowments worth \$135,000; its buildings and grounds beautiful, ample and commodious; its halls filled with students; its Professors faithful and capable; its philosophical and other demonstrative apparatus extensive and efficient; its Trustees and Faculty united and harmonious; its location healthful and beautiful, even to the measure of a proverb; its social atmosphere moral and refined; and the Queen City of the kingly "West"

within our vicinage—all combine to attain the highest point of success to which even our hopes may aspire, and to render the institution, at once, a most beautiful home and profitable school for the student desirous of prosecuting study in any department of education, practical or speculative—in the languages, ancient or modern; and in the sciences, physical or philosophical.

Our system of instruction and the curriculum of studies are, in some particulars, different from those usually pursued in other Institutions. This difference has not been adopted, however, from any desire to obtain notoriety by an eccentric divergence from the routine of Collegiate procedure handed down from olden time; but, from a certain and positive conviction that the wants of the public, and the demands of the age, require such modification in the arrangement of studies, such adoption and incorporation of the practical sciences appertaining to the useful arts and all the industrial pursuits, into the course of university education, as may prepare young men to enter upon and prosecute those pursuits, not only with an understanding of the philosophic and scientific laws on which they rest, but also with a ready knowledge of the practical duties which those pursuits require. Let us not be misunderstood: We neither abbreviate nor diminish the usual college course; we rather extend and amplify. We do not, by any means, repudiate the study of the ancient classics; on the contrary, we recommend them strenuously. But, we do not make them a *sine qua non* to the honors of the Institution, when the full equivalent of intellectual development and mental cultivation are attained. Modern languages we equally recommend; and have, accordingly, provided the ap-

propriate Professorship, now most ably filled. To the student looking forward to mercantile life we afford ample instruction in book-keeping, to which will, henceforth, be added a full course in Commercial Law. To the young man whose attention is directed to the important profession of civil engineering we afford the appropriate course in mathematics, pure and mixed, with drawing, physical science, &c., accompanied with practical field lessons. Does the student propose to make Agriculture his pursuit? Here he is instructed in the attainments for the Educated Farmer, and is taught, especially, those sciences directly bearing upon that profession, which, in fact, when thoroughly prosecuted, embraces and involves almost "the whole circle of the sciences." And so with other pursuits and their appropriate studies—we invite the pupils to all; we exclude them from none.

Likewise, in view of the practical utility—nay, even the growing necessity—that the "business men" of our country—And America furnishes no other class, *save one*; and that other one is the *genus*, "Loafer:" In view, I say, of the necessity that our business men should have a well defined knowledge of the principles of the constitution and the rudiments of law, the Trustees of the Institution, with a liberality most praiseworthy have established a department for instruction in the institutes of our civil jurisprudence. This is done in order that young men, whatever may be their pursuits, may be instructed in the principles of the constitution and laws, under whose administration they live, and to whose requirements their business must conform, as well as to fit them for a wider and higher sphere of usefulness should the public voice call them to stations of honor either

in a magistral, executive or legislative capacity. That department has, among other topics, been committed to my hands; and, henceforward, familiar, but full, instruction will be given in the law of contracts, of bailments, of the domestic relations, of insurance, of partnership, of the administration of estates, of bills of exchange and promissory notes, guaranty, surety, &c. And, in this, while it may not be my aim to make lawyers of our students—though it would aid, materially, those who might thereafter make the Law their profession—my main purpose would be to impart to them knowledge of the law at least sufficient to enable them to keep themselves and their neighbors clear of litigation; or, if compelled to resort to legal machinery for the protection of person, property or reputation, that they may be prepared to proceed understandingly; and, above all, to know when their legal business has been faithfully and skillfully conducted. And for all this, it must be that my practising Brethren of the Bar will surely “rise up and call me blessed!”

Besides all these, there remains another important and characteristic feature of the Institution every way worthy of particular remark: I allude to its separate Department of scientific and practical Agriculture, connected with an experimental farm, at the head of which stands President Cary; and to which he is bringing the advantages of his invincible energy, of his rare attainments as an Agriculturist, and of his ripe accomplishments as a scholar. And it affords me the highest gratification to announce that this Department is, everywhere, receiving the most hearty plaudits of public approval. And I do not hesitate to submit the assurance that before the recurrence of this day's first

anniversary, the FARM DEPARTMENT of the Institution will be fully organized, whereby the lessons of the Lecture Room and the Laboratory shall be explained by practice, and the mooted doctrines of Agriculture be tested by experiment.* And, if this assurance be realized, then here, on COLLEGE HILL, will be founded and organized the first College of Scientific and Practical Agriculture ever established on the American continent! Such an achievement is, indeed, well worthy of the loftiest ambition of the loftiest mind. To found and to endow such an institution—the first of the kind in all the Western Hemisphere—in view of its multiplied blessings, forever-enduring and forever-increasing, would form the loveliest leaf in the chaplet of Fame that Munificence ever could wreath around the brow of Opulence. As we have noted, already has “Cary’s Academy” become “College Hill;” and when our “EXPERIMENTAL FARM DEPARTMENT” is achieved, then “College Hill” becomes “UNIVERSITY HEIGHTS!” And, *achieved it will be*. For, though Government, while lavish of appropriations to Commerce and the Arts, is both deaf to the demands and blind to the interests of Agriculture; yet the wealthy citizens and liberal-minded farmers around us in Ohio, Indiana and Kentucky are joining hands, and saying, “*It shall be done—let government sleep on.*” And, as to this matter, their affirmative fiat, is fate. Let them but speak and “’tis done!” Let them command, and it shall “*stand fast.*”

*Within a few months past two separate Professorships in this Department have been endowed, by the munificent donations of two wealthy gentlemen, in the sums of \$10,000 each; which, united with other large and liberal donations received chiefly from the Farmers in this and the adjoining counties, make an amount of about \$50,000, secured within six months past, for the purchase of the farm, and the organization of the appropriate Professorships in this Department.

Heretofore our Colleges seem to have been founded and endowed for the paramount purpose of educating young gentlemen for what was termed the "learned professions;" thereby signifying, Law, Medicine, and Divinity. Occasionally would be found a merchant who had strayed from the College to the Counting Room; but, most seldom, indeed, was it that the student of a College ever found his pursuits in the field of the Husbandman, or in the factory of the Artizan. The Farmer and Mechanic could, then, attain to but little knowledge of the sciences appertaining, even, to their own pursuits; and that little reached them only by a species of irregular and spasmodic percolation from what were deemed, the upper strata of those "learned professions;" and even its quality seriously and sadly deteriorated by reason of the incongruous characteristics of the filter through which it had passed! But this state of things no longer obtains; and should have been abrogated long ago. The sturdy arm of Labor and the cunning hand of skill are asserting their inalienable rights to the privileges of a scientific education. They are unwilling to receive the lessons of science at second hand, as the mere *dicta* of others—they are resolved to interrogate Nature for themselves. To all such, whether rich or poor, whether humble or exalted, we, emphatically, say—COME!

From the ranks of the humblest have come many—yea, indeed, *most*—of the brightest ornaments of intellectual humanity. And here, in this arena, while I have the honor to occupy this position, the child of the pauper shall be allowed to contend, equally, for the palm of intellectual superiority, with the sons of the wealthy and the distinguished. For in matters of edu-

cation, as well as in government, we concede no patent of nobility to any rank, granting the exclusive privilege of being recognized as the gifted and the great. We recognize as such, none but those who bear the seal of the Divine credentials; on whose intellect is graven the ineffaceable patent of Jehovah, entitling them to rule as monarchs in the broad realms of mind. And genius, whatever be its features—whether it rules in Mechanism, in Commerce, in Poetry, in Agriculture, in Science, in Philosophy, or the Arts—is equally a child of the Divine: no matter what may be its externals, no matter what may have been its antecedents, its birth-place or parentage; it is still the only real ennobling *ensignia* to which we yield a faithful and voluntary reverence. The Illiad of a blind beggar, called HOMER! is as grand and melodious as though penned by a Prince clad in the imperial purple; the discovery of the New World by a poor carpet-weaver, named CHRISTOPHER COLUMBUS! was an achievement as illustrious as though accomplished by the royal Ferdinand himself; the oratory of a Grecian black-smith, sir-named DEMOSTHENES! was as terribly impressive as though, instead of his hammer, he had wielded the sceptre of the Macedonian. The illustrious HOWARD, whom dangers could not turn nor death terrify from works of humanity, whose philanthropy was as wide as the world, and whose benevolence both hemispheres delight to remember, this “nobleman of Nature” was a grocer’s apprentice. The renowned WHITFIELD was the son of an inn-keeper: Hogarth, of a world-wide fame, was an engraver of pewter-plates: Dr. MOUNTAIN, Bishop of Durham, was the son of a beggar: Virgil was the son of a potter; and HORACE the child of a shop-

keeper. SHAKSPEARE, the wise, the witty, the "immortal" was the poor child of an humble wool-trader: the great BEN. JOHNSON worked with his own hands as a brick-layer: GRAY, whose "Elegy in a country church-yard" would have immortalized his name had he written nothing else, was the son of a scrivener, and so, too, was MILTON: HENRY KIRK WHITE, the melancholy poet of midnight and of tears, whom Byron's name was honored in eulogizing, was the son of a butcher. BLOOMFIELD and GIFFORD were both shoemakers; BURNS and RITTENHOUSE were both ploughmen; FRANKLIN was a printer, and WASHINGTON a farmer. SIR RICHARD ARKWRIGHT, the inventor of the spinning jenny, which, it is said, was the means of carrying England triumphantly through the wars of the French revolution, was a barber: FERGUSON, the great Astronomer of Scotland, was a shepherd-boy: the great Artist, CLAUDE, whose paintings are the admiration of the world, and the pride of kings, was a pastry-cook: SIR HUMPHREY DAVY, President of the Royal Society of London, the most distinguished *savant* of Europe, was the son of a carver of wooden images. Thus, ever from the low horizon of earth have risen those "bright particular stars" that deck the firmament of mind, and shed their glowing glories over all the human race!

Such examples afford us the ample assurance that both Literature and Science refuse to do homage to either Lucifer or Mammom: Hence, that the college is to be considered as the school exclusively for pupils of wealth and commanding social distinction, is an obsolete idea. For, independent of the rule of right in the premises, sound political economy repudiates such an appropriation of public institutions to purposes so

foreign from their capacity of doing good, and to pander to prejudices so mischievous and absurd. For, certainly, a moment's reflection will suggest to any intelligent mind, the significant inquiry—"Why not adapt the College to the educational demands of the industrial pursuits, as well as to the requirements of the professions?" Agriculture is, emphatically and confessedly, the interest *paramount* of this whole continent? And, I speak advisedly in saying, that its proper and successful prosecution involves a measure of general scientific knowledge even more extended and minute than is employed in either of the "learned professions."—With the latter there is demanded more of abstract and speculative philosophy—more of what the older universities denominate the "humanities"—then, let the College retain and instruct in these; but, the former, i. e. Art and Agriculture require more of the practical and physical—more of what we call the "sciences"—by all means, then, let them, too, be supplied with these from the college halls and laboratories, tested by the experiments of the crucible and by the experiments of the Farm. But, it may be objected, that this course involves the necessity of the student himself selecting such studies as he pleases for his own particular course; and so, in fact, it does; nor is this deemed at all objectionable in principle, nor is it found at all impracticable in execution. Such is the system pursued in the German Universities, and no schools in the world furnish more enthusiastic nor more thorough students in the prosecution of their chosen and favorite branches. In his report to the Trustees of Brown University on the subject of Collegiate Reform, made in 1850, President Wayland suggests and recommends, in

this particular, a similar course of procedure ; and the reason assigned seems conclusive of its efficiency—"because, *in every step of his duty the student would be attended by interest ; and the alliance of both interest and duty is proverbially efficient.*" Nor is this, by any means, merely a fanciful change—it is improvement, it is practical progress : It is an amplification of the educational capacity of collegiate instrumentality, in proportions corresponding to the amplified requirements of industrial pursuits. To do less, would be to fall behind—to remain stationary, is equivalent to retrogradation ; and thus to linger and stumble before the rushing wheels of this progressive age, and this progressive people, is tantamount to annihilation beneath their ponderous power and rapid revolutions.

So far as the Agricultural interest of the country is concerned, this advancing movement in our systems of University education is, now, *imperatively demanded*. We have reached the point where any postponement of such advancing movement is not only weak, but, also, *wicked*. EARTH, the Great Thesaurium of Nature, whence are derived all the sources of our wealth, as well as all the supplies for our wants, is becoming itself exhausted by reason of excessive depletion. This great "Fiscal Agent" of humanity, under the protracted pressure of a continued "run" upon her resources, is beginning to protest the drafts of Agriculture, and is curtailing her discounts of the "offerings" of husbandry—not because they are themselves insolvent, but because their account of "deposits" is already enormously overdrawn, and the footing of the balance-sheet is fearfully in favor of the "Parent Institution!" Her facilities for granting relief are consequently crippled by this

mole-eyed policy of her own stockholders and directors; her dividends are proportionably meagre, and eventual bankruptcy seems impending. As vouchers for this statement, I invite your attention to a brief synopsis of facts and figures —the “report” issued by the “Fiscal Agent” itself. It is known that two of our great staples, both of consumption and exportation, wheat and tobacco, are among the most exhausting crops found in nature. The most vigorous soils are required for their profitable production; and, when once the land is exhausted by their growth, it exhibits a sterility as disheartening as it is unprofitable. In the early days of New England the fertility of her virgin soil, and its bountiful production of wheat caused even astonishment, and yielded returns to the hand of husbandry of such exuberance as to surpass even the dreams of the farmers themselves. They, most unwisely, believing this fertility “inexhaustible,” were utterly heedless of even the ordinary expedients of considerate husbandry, for perpetuating the resources of the soil; and the result is, that the soil of the same New England is now absolutely incapable of producing wheat as a remunerative crop; and the entire population is supplied with breadstuff from the fields of the West. In 1850 the State of Connecticut produced but 40,000 bushels of wheat; Massachusetts but 29,000 bushels, and the whole State of Rhode Island, once famous for the fertility of her “Providence Plantations,” raised only 39 bushels!

The whole product of wheat in the six New England States, Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island, in 1850, was about *one million* of bushels; while the single State of Ohio

yielded nearly *sixteen millions* of bushels. In Dutchess county, one of the most fertile regions of N. Y., where they formerly reaped from 30 to 40 bushels per acre, they are now gathering but from 5 to 7! And, in reference to her tobacco, Virginia has pursued the same suicidal system of agriculture. They went carelessly over their soil, extracting the riches of its virgin fertility by a system of cropping which would be incredible did we not, now, witness the same on the fertile plains of the West, and leaving behind them its exhausted remains as mute but monitory witnesses of their heedless improvidence! Hence is manifest the imperative demands of the public interest—the national welfare—requiring agricultural science to interpose in order to prevent this egregious waste of raw material, and to save Agriculture “*from its friends.*”

From the Report on Agriculture issued by the U. S. Patent Office, 1849–50, we learn that in the State of New York there are twelve millions acres of improved land. Of this, one million are so cultivated as to yield abundant harvests, and yet to become richer from year to year; and are in the hands of 40,000 owners, who, by study, reading, and experiment, make themselves conversant with agricultural science. Three millions of acres, (continues the Report) are so managed as to barely hold their own in point of fertility; and these three millions are in the hands of persons who are anxious, but, lacking early education, are unable, to pursue agriculture scientifically, only as they can gather from observation, and by seeing how others, more intelligent than themselves, are improving their stock and estates. While the remaining eight millions of acres are in the hands of *three hundred thousand* per-

sons, who still persist in the semi-barbarous practice of extracting from the virgin soil all it will yield, so long as its yield will pay expenses; and then leave it in an impoverished and unprofitable condition.

Certainly, to call such a course of procedure *Agriculture*, is an abuse of language and a perversion of truth: it is *waste*, and not "*culture*." And the estimate on this subject, officially reported to the Patent Office, declares that "*one thousand millions of dollars would not more than restore to their original fertility the one hundred millions acres of lands in the United States which have been already subjected to this exhausting and depleting process.*" These facts are astounding! Sound principles of economy, private and political, as well as the undisputed and indisputable doctrines of moral right should be invoked to prohibit this profligate prodigality of our resources. Remember: Posterity is coming after us—and already its myriad-toned voice is heard murmuring to our ear, in the distant echo, conjuring us, by all that is sacred on earth and holy in heaven, to pass onward to them the blessings of those free institutions which our fathers have transmitted to us: and such an adjuration coming from such a source, stirs the deepest determinations of the human soul, resolving, that, as we have been thus favored, so shall those be who are to come after us! Shall we then hand down to them the mere skeleton of our country, bereft of its beauty and deprived of its abundance? Can we be content to transmit to them simply an "Ideal Republic," whose substantial comforts our prodigality has wasted, and whose elements of wealth our improvidence has squandered? Nay! Let it be equally remembered, that for them and their appropriate

uses, these broad fields, these fertile valleys, those undulating plains, spread over all this wide and widening Republic, are, also, *held in trust*.

We may not be permitted, then, to impoverish those fields, to make desolate those valleys and plains—in a word—not permitted to commit waste while in the use of our life-estate, against the proper claim of those to whom the reversion belongs, by this prodigal and improvident use of the earth. “*The earth is the Lord’s, and the fullness thereof.*” Man is but a tenant for life; and when his life-lease expires, he is morally bound, by contract implied, to surrender the possession of the premises he occupied, in as good a condition as he found them. Hence, for man to commit waste by ignorant and improvident husbandry, is to perpetrate high-handed wickedness against the Landlord, and to inflict a heinous wrong upon His succeeding tenantry. And, Posterity, as infant parties, now, by their ‘next friends,’ do, accordingly present their Petition in the Chancery of Science, praying for a decree of perpetual injunction against their ancestry, to prevent the commission of waste to their reversionary interest; and, viewed in every possible relation of right and good conscience, we must “find that the equity of the case is with the Petitioners.” That this improvidence of the present, and this catastrophe to the future may be avoided, is the aim of Agricultural Science. And we feel assured that, in every conceivable light—as to its relations to public and private economy; to moral right and contingent wrong; to present duty and future prosperity—its importance not only justifies, but even demands the prominence we give it in our curriculum of College studies.

I am, nevertheless, aware that some distinguished scholars and eminent teachers demur to this view touching the amplification of Collegiate studies — maintaining that the more appropriate procedure, is for the College to “brace up the old scholastic course.” Among such is Professor LEWIS, of Union College, New York, who has gained some prominence in this position by reason of his essay published on the subject. In his essay Professor LEWIS rejects the opinion that a man understands his trade or profession better for being versed in the principles of science connected with his pursuit, and, in a phrase somewhat exultant, demands “Why the practical man should study out for himself what the thoroughly scientific man can study out to *so much better advantage?*” And he further declares, that “the practical application of science must always be the *empirical use* of principles evolved in the closet and the laboratory.” But, in his triumphant interrogatory, the learned Professor has utterly misconceived the aim to be attained by this Collegiate reform.—He says, let the “thoroughly scientific man study out,” &c. We concur: but our aim is to make the “*practical man thoroughly scientific,*” in order that he may study out for himself what Professor L. would have another study out for him. His position involves, and indeed he claims the necessity of making distinctions and classes. It would make some the generators of knowledge, others mere passive receivers, and others, again, mere nominal appliers.”

And his only apologetic defense of this is, “the tyrant’s plea — necessity:” for he declares “we can not help it.” Now, this is tantamount to the assertion that society needs a distinct class of men *to do its thinking!*

A blunder so huge as to be almost sublime ; but, falling one step short of that, becomes hugely ridiculous. This is the very quintessence of "Old Fogysm" — "Hunkerism" in its most frozen, frigid, unmitigated form. Nor do I deem our learned Professor any more fortunate in his second position — that "the practical applications of science must always be the *empirical use* of the principles evolved in the closet and the laboratory." For, if I opine correctly, facts of a most important nature array themselves against this doctrine of Professor Lewis ; and it would not be difficult to show that the practical applications of scientific laws have been made before they became the subjects of investigation in the closet, or of experiments in the laboratory. Practical science is, indeed, but the common-place book of Nature: Her closet is never closed — Her laboratory is every where and forever open. A floating log suggested the boat, and the motion of a fish's tail supplied the rudder. Accident drew the first portrait, by throwing a profile upon the wall. A piece of flint, falling into a fire, mixed with some sand, they were fused, and the world had glass. The simple boiling of water gave birth to the steam-engine, which, in the language of Kossuth, "makes distance obsolete." The flying of a child's kite, in a storm, suggested the electric telegraph — that marvelous invention which makes both *time and distance* obsolete, which gives to the rock-ribbed globe a *nervous system*, and makes a whispering gallery of the world ! All these facts, first applied *outside* of the laboratory, put science on the *qui vive* ; and the principles evolved have not been, by the intelligent, practical man, in any wise *empirically* applied and employed. Our aim is to put science into

the hand of the practical man, in order that he may move understandingly through the laboratory of nature, and not "empirically," like the hooded messenger of the *savan* of the closet, sent simply to do his errand-bidding. In none of these particulars, therefore, can we subscribe to the opinions of Professor LEWIS.

I may be permitted to suggest that the term "science" is so frequently employed in our common speech that, like all common phrases used in colloquial parlance, it is liable to lose somewhat of its precision of meaning before the mind; hence, it may not be amiss to determine its legitimate signification. And, I conceive the true definition of Science to be — *knowledge, reduced to order.*

The mere attainment of heterogeneous knowledge, however vast and accurate, is no more to be regarded as 'Science' than is the unwashed gold to be regarded as coin. The condensing crucible, the stamp and dye of the mint must first reduce the golden dust to form and order, before its denomination can be given and its standard value fixed. The miscellaneous collection of amorphous facts, however numerous and well-determined, do not constitute a *science*, any more than do the scattered blocks of unhewn marble constitute a temple. The sharp attrition of refined experiment must first give shape and polish to those unhewn blocks; the line and level of truth must fix their exact relative position; the plastic hand of order must adjust the combined proportions, before the admiring architect can say "'tis finished." So, in relation to attainments in science, it may well be said, that

"Those rules of old, *discovered*, not *devised*,
Are nature *still*, but nature *methodized*."

It is knowledge reduced to order—it is *Science*. And, now, what is Art? *Art is science reduced to practice*: and this procedure involves the employment of the most substantial philosophy. Again: What is philosophy? I know no better verbal equivalent than this—philosophy is *sound common sense, well informed and thoroughly disciplined*. A principle of science, once determined, becomes, when applied, a rule of Art. Art, therefore, implies and presupposes scientific knowledge as its predicate. Then, while Science is the source of Art, Art is the right hand of Science. Science has Art for its exponent and interpreter; Art has Science for its tutor and its guide; but this philosophy, above mentioned, must be the torch-bearer along the path. And this is true of every department of Art, whether agricultural or mechanical; and it is through the instrumentality of this combination that Art has invested man with the dominion over matter:

“She led him through the trackless wild,
Where noontide sunbeams never blazed;
The thistle shrunk, the harvest smiled,
And Nature gladdened as she gazed.
Earth’s thousand tribes of living things,
At Art’s command to him are given;
The village grows, the city springs,
And point their spires of faith to Heaven.
In fields of air he writes his name,
And treads the chambers of the sky—
He reads the stars and grasps the flame
That quivers round the throne on high.
In war renowned, in peace sublime,
He moves in greatness and in grace;
His power, subduing space and time,
Links realm to realm, and race to race.”

Science and Art thus commingled, and thus employed, become *philosophy made visible*! Like the banyan of the Orient, Science first sends up its centre shaft,

whose luxuriant branches, spreading, turn toward their native source; these strike root anew, and again shoot up new stems, bearing other branches, which also widen as they grow, all adding new vigor and lending additional beauty to the parent stock.

The method of prosecuting scientific study—i. e., the process of reducing knowledge to order, is strictly an inductive process, whether prosecuted in the field or the laboratory. Induction consists in classifying facts, and stating the inference, or result of the generalization, in such a manner that the evidence of the correctness of the inference shall itself be manifest. Like mathematics, starting from the “given” — from facts—it proceeds to determine the whole truth touching their relations: starting, thus, from the known, it sets out in search of the unknown, to which, indeed, it may attain and demonstrate its laws. This, theory and speculation can never accomplish.

BACON found the philosophy of the ancients altogether speculative and hypothetical. In the construction of their systems of science, Nature had scarcely been at all consulted, while Aristotle was appealed to as an oracle, and to gainsay his dictum, was, among the Greeks and even by the scholastics of succeeding centuries, held to be an impiety deserving of divine retribution! And under the auspices of this philosophy the Greeks did condemn, as guilty of impiety towards the Gods, those who first attempted to make known the cause of thunder! In the schools of both Aristotle and Pythagoras, logic was held to be the touchstone of science, as well as the test of philosophy; and the principle of all logic, as you know, is to examine only the form of the statement and the deductions,

but never to *question the premises*. As an example of this I may allude to the much vaunted Pythagorean theory of cosmography, which, though sanctioned by the opinion of Plato, must nevertheless excite a smile on the visage of even sober-browed philosophy. The Earth, he said, was a living, animate creature, of immense magnitude: this point assumed, it followed most logically, as he declared, that it must breathe! Very well. The next step in the logical formula was, that in its respiration, its huge breathings affected the level of the ocean! Certainly it would. And thereupon followed the ultimate conclusion that *thereby were produced the flux and reflux of the tides!* And such continued to be the philosophy of the world for more than two thousand years. With such utter misconception of nature's laws, we can scarcely wonder at their concomitant doctrines concerning the origin of the the human race, which maintained that man owed his primitive paternity to the honorable and venerable ancestry of *Grasshoppers!* And from this authority, certainly renowned and hoary, it is hoped that the "progressive development theory" of Lamarek may derive an appropriate sanction!

LORD BACON is called the author of the Inductive Philosophy, and with him certainly it first assumed a systematic form; but its germ had long before been planted: the genius of Bacon, however, enabled him to gather its harvest of renown. The system of Plato, though obscure, was, in a measure, inductive. And Socrates claimed for the mind "a capacity to go from the point where it is, to the point where it yet is not." For this he prescribes the process as passing from the known to the unknown — from the *particular fact* to

the *general truth* — by the force of an analogy “which is first only a resemblance, then becomes a probability, and finally resolves itself into certitude.” This is, substantially, Induction. But the Inductive Philosophy belongs to no school, to no sect, to no age; it is the common property of the human mind, of whose laws Socrates and Plato, like Bacon, were among the great expounders. While Aristotle would test all things by the syllogism, Induction reduces every proposition to a problem — hence, while the conclusions of the former might be fallacious, the resulting inference of the latter must be demonstrative.

The philosophy of the “Stagyrite” having once assumed the premises, was most anxious concerning the accuracy of the syllogistic conclusions; but the philosophy of the “Organum” is most anxious as to the accuracy of the elementary facts, and then pursues the inference with undeviating fidelity. To what had been “said by them of old,” and to doctrines coming from “authority in high places,” both the Academicians and the Peripatetics were profoundly deferential; but, Induction pays no respect to the apotheosis of error, and contumaciously scouts the servile sentiment, mentioned by Cicero as prevalent among the ancient schools, that they would “*rather be in error with Plato than correct with any body else.*”

In the application of the Inductive Philosophy to Physical Science, the mind of the student should be fully apprised of the ever-recurring danger of predicating scientific opinion and practical action upon what may, indeed, be *facts*, but which remain before our minds as *isolated* facts—he should be continually guarded against the continual temptation to proceed

upon the faith of facts not classified — not yet generalized. This is leaping to conclusions; but it is leaping in the dark; because, facts not generalized, not reduced to order, can not, in any manner nor by any means, establish the existence of a scientific law. The homely proverb, that “*one swallow* does not make a summer,” is not more emphatically true than that, a *single fact* does not establish a law. The single swallow may herald the approach of, but does not bring, the summer: so the single fact may indicate, but does not demonstrate the law. Inattention to this is what mounts the scientific Tyro, guided by a single fact, and of course, possessed of but one idea, upon some long-eared hobby, whose asinine vagaries and intractable eccentricities will carry him far astray; and, even if finally rejected, like all lawless cattle, will return only to vex the person by whom it was, so unwisely, bestrode. Remember, then, that the *single fact* is where Induction begins; the demonstration of the law in relation to the fact, is where Induction ends: and, between this beginning and the end may lie a whole archipelago of facts — each, isolated, by itself; while the relations of all must be grouped into system in making our way from one to another, on toward the mainland of truth. By the grouping together of different facts are inferred their mutual relations; and, *these relations of things are the laws we seek*. And, certainly, a single isolated fact can no more demonstrate relations, than a single numerical unit can express numerical combinations.

“The first and great commandment” of the Inductive Philosophy is, “*Thou shalt call no man Master!*” “and the second is like unto it” — “*Prove all things, and hold fast that which is good!*” Accordingly, thus

saith the “Instauration” — “a really useful induction for discovery and demonstration in science should not be all absorbing of facts; but should sift and separate nature by proper rejections and exclusions, and then to conclude for the affirmative after collecting a sufficient number of negatives.” And, having done this, you will discover that those very negatives stand by, protesting in behalf of the affirmative.

In the sententious diction of Lord Coke a “protest” is defined to be “*the exclusion of a conclusion.*” And, accordingly, those negatives are so many solemn protests for the exclusion of every other conclusion than such as the affirmative facts establish. As an illustration, permit me to allude to a familiar example:

Among the old philosophers, water, as you know, was assumed to be a simple substance — an element; and, then, to have spoken of the composition and decomposition of water would have been pronounced as in contradiction to Aristotle, and, therefore, both foolish and profane! But, with a few plain plates of zinc and copper the student now decomposes water, and finds its constituent elements to be oxygen and hydrogen. It may surprise him to learn that in thus forming water, Nature, as though sporting with antagonisms and incompatibles, has employed the essential element of the atmosphere, and the sole supporter of the combustion. Next, he is astonished to find that these elements, of which all the rivers and oceans of earth are made, when united in their gaseous forms produce a mixture dangerously explosive; and he further learns, with wonder and almost fear, that, by the application of flame at the junction of their mutual currents, these constituents of water will ignite, and burn with a heat

so intense as almost instantly to dissolve and consume the firmest metals; but, finally, he is overwhelmed with amazement on discovering that the residuum of these gases, thus passing through this intense flame, this consuming fire is again — not ashes, nor cinder, — but is again WATER! And thus this surprising negative lends all the force of demonstration to the affirmative conclusion touching the composition of water.

It is, moreover, manifest that the constancy of Nature — the absolute fixedness of her laws — is the necessary foundation of physical science, and the indispensable condition upon which induction proceeds. — For, deny this supposition — admit that Nature does not always resemble herself, and we have no longer a guaranty that this right shall restore the coming morrow; the whole future eludes our foresight, and nothing remains but the bubbling cauldron of chance: Chaos and Cosmos become convertible terms; Science — knowledge reduced to order — would be a sheer impossibility, and philosophy would be but the synonym of insanity.

It has been by many supposed, and by some declared, that the extended and critical study of natural science tends to unfix the mind in its veneration of a God — that the abstruse investigation of nature's law fosters a kind of philosophic atheism. And, it is true, that when natural science first began to reach the multitude, many of its *soi disant* expounders, founding their doctrines and opinions upon isolated and unclassified facts — of which I have spoken, as inconsistent with philosophic induction — with what they denominated Science, supplanted religion; and, for the deductions of human reason, discarded revelation. They accordingly

proclaimed the universe to be a self-formed, self-poised, indestructible effect, and consequently without a creator. Such was the *atheism* of France. Another change has more recently come over the spirit of skepticism : and, still invoking science without revelation, it has come to be maintained — not that the creation is without God, nor that the creation is only a manifestation of God — but, that the *creation is God* ! Such is now the *Pantheism* of Germany, whose doctrines are far more prevalent, both in Europe and America, than is commonly supposed. In the first place, Atheism deprived creation of all paternity, and made the *universe an orphan* ! Scholasticism next presented creation with a God, but a God of utter abstraction ; so separated from the world and humanity that all providential notice and supervision are denied to him. This gives creation a parent, to be sure, but, worse even than the orphanage of Atheism, makes him a parent discarding and scorning his own offspring ! It makes him a king, certainly, but renders him a solitary, emotionless monarch, thrust into exile from his own dominions ; by denying him all sympathy with creation, it seats him far away from creation, on the bleak and deserted throne of a blank and silent eternity. Shuddering at this awful chasm which scholasticism had placed between God and Humanity, and desirous of approximating Creation and Providence, the modern movement began in pronouncing God to be the universe ; and finally ends in declaring the Universe to be God ! And such is Pantheism. This, consequently, presents a God so incorporated with Creation as to be absorbed and lost in the works of his own hands ; thus exhibiting to the philosophic mind this most egregious paradox of compress-

ing the Infinite within the limits of the Finite. Standing in the presence of the Universe, wonderfully great and sublimely glorious though it be! and saying — “THOU ART GOD!” is to say that the universe has not a cause greater than its effects: and thus *Pantheism* is resolved into *Atheism*. The ultimatum of this much vaunted modern pantheistic philosophy goes no further, and asserts no more sublime pretensions, than those contained in the *philosophy* (?) of the untutored Savage, who

“ Sees God in clouds, and hears him in the wind.”

Its deepest revelations claim no higher sanction than the authority of Natural Science — its loftiest aspirations consist in paying an undevout reverence to scientific grandeur and artistic beauty — its whole catechism and creed are compiled from a source of no more solemn sanctity than the *theology of mathematics*!

I have already alluded to the demands of both private and public economy, requiring this extended public instruction in physical science because of its paramount utility to the practical arts and industrial pursuits. And, from what has just been said, it seems manifest that physical science has become and is to be the battle ground in the great contest between Christianity and the Infidel doctrines of this modern Pantheistic dogma. And in that contest it were unwise to yield the vantage ground of superior science to the opponents of revelation: I would not, by any means, suffer the enemy to hold all the fortifications, to wield all the artillery, and retain all the ammunition. I would, therefore, have our students and young men, clad in the panoply of science, go forth to benefit the race in every sphere of usefulness — to look with wide-reaching, philosophic eye upon the stupendous marvels of Omni-

potence ; not to “blindly deify the idol, Chance :” I would have them go forth as the professed disciples of that vast and erudite volume of Science, “whose *body Nature* is, and GOD THE SOUL !” I would enjoin them to go forth, in humble admiration, to contemplate the minute yet wondrous cinctures that “wed Creation to Divinity ;” assuring them, that while they wonder and adore, they will be continually prompted to exclaim

What are WE !
 “MOTES, floating in the gleam of All-creating Light !”
 Yet born to live when Nations die ;
 The comrades of uncounted years !”

Such, Young Gentlemen, will be the characteristic features of the tuition you may here expect to receive : Such, Gentlemen of the Faculty, will be the nature of the instruction we will be required to give : Such, Gentlemen Trustees, will be the sentiments we shall aim to inculcate, such the doctrines we shall hope to enforce : Such, Friends and Fellow Citizens, will be the purposes we shall hope to attain, such the advancement we shall aim to secure. Permit me, then, to ask the co-operation of all of the Public, Trustees, Faculty and Students, for the attainment of “a consummation so devoutly to be wished.”

And in this we must learn the student that the mind must *work for what it feeds upon*—like the body, it must labor for its necessities, as well as for its wealth. In systematizing this labor, and to make pleasant this toil, the Inductive Philosophy will be our chosen medium, and chief reliance. Upon its towering, tireless wings may human genius mount, and like the Angel of the Apocalypse, go flying through the midst of heaven, gazing with inquiring wonder upon the wide-spread amplitude and unspeakable glories of God Almighty’s

Universe. It is this Philosophy, which, like the ladder seen in the vision of the patriarch, is let down from above, and which reaches from earth to heaven, affording to human thought the means of ascent into those altitudes of Science where, almost, "Angels fear to tread." Upon this the scientific mind mounts, step by step—each round gained is but a step towards the one above: it rises from effects to cause—from facts to laws; it finds the cause it sought, to be but the effect of some higher cause: It mounts again; and again it finds a greater cause above. And up it rises, and still up, to seek the ultimate cause; and still ascending, still he finds the First Great Cause to be "past finding out." Here his physical science ends, and the metaphysical begins. But the great ascent is not yet complete—the "*causa causarum*" remains still unaccounted for; nor is it possible for the human mind even here to halt. Johnson, speaking of Shakspeare, says:

"He exhausted worlds, and then imagined new!
Existence saw him spurn her bounded reign,
And panting Time toiled after him in vain!"

And, as it was with the genius of the Poet, so it may be with the science of the Savan; for his conceptions of the Universe overleap the bounded horizon of the physical, and with eager induction he grapples with the moral and the metaphysical. This Philosophy it is that whispers to his ear the mystic password by which he transcends the "bounded reign" of physical existence, and, leading him up, with solemn reverence, beneath the pillarless dome of Eternity, inspires his soul with a devout contemplation of that Divine Intelligence which

"Lives through all life—extends through all extent;
Spreads undivided—operates unspent,"

Finally, we have the wonderful faculties of the human intellect as the materials and instrumentalities upon which the process of the inductive philosophy is to operate ;—intellectual faculties which, in their creation, are projected on a scale commensurate with the range of the Universe, fitted for the fellowship of Angels, and for the friendship of God ! Faculties, which, with a glance that leaves the winged lightning behind, can dart backward to the infancy of Time, and sound the dateless depths that spread in solemn silence beyond ;—or forward, through Time's course and consummation ; and on, and still on, among the awful cycles of Eternal Futurity ;—Faculties, which, in their excursions through the wide dominions of authoritative history, as well as in their imaginative rambles through "the long-drawn aisles of the past," can pause where they list—can hold glad converse with adoring Shepherds and Angel watchers around the rustic bed of the Babe of Bethlehem—can confer with Prophet, Priest and Patriarch ; or, mingle, in gladness, with the "Sons of God" while shouting for joy around the new-laid pillars of an unfinished world !

And yet, stimulated and sustained by faculties such as these, and yearning in desire,

"To follow knowledge, like a sinking star,
Beyond the utmost verge of human thought ;"

you will not, nay, Young Gentlemen, man cannot, find a world nor an atom that is not stamp'd with the royal signet of JEHOVAH ! For, though our minds may climb to the very battlements of science, and though our imaginations, soaring thence, should roam beyond, still, we could only say,

"Through all the vast, and the minute we see
The unambiguous footsteps of a God,
Who lends its lustre to an insect's wing,
And wheels his throne on rolling worlds !"



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